



The Bayou Observer

June 5, 2011

SUMMER 2011 EDITION

2011 Atlantic Basin Hurricane Outlook

On May 19, the Climate Prediction Center (CPC), a division of the National Weather Service, issued the 2011 Atlantic Basin Hurricane Outlook. This year, CPC is forecasting another active season with 12 to 18 named storms, 6 to 10 hurricanes and 3 to 6 major hurricanes. In an average year, we usually expect 11 named storms, 6 hurricanes and 2 major hurricanes.

The forecast of an active season is based in part on the following factors:

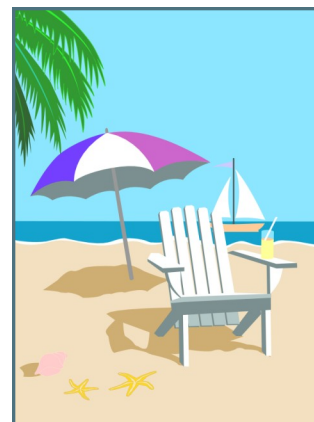
- The multi-decadal signal, which has contributed to the high-activity era that began in 1995
- Continued above-average sea surface temperatures in the main development region
- Neutral ENSO conditions with some lingering La Niña impacts

2011 Outlook	Type	Avg
12 to 18	Tropical Storms	11
6 to 10	Hurricanes	6
3 to 6	Major Hurricanes	2

While the 2011 season is forecast to be an active one, NOAA makes no long-range forecasts concerning potential landfall locations or landfall probabilities. It should be noted that an active season does not necessarily result in numerous landfalls. 2010 was an active season with 19 named storms, but there were few impacts to the northern Gulf Coast. Conversely, 1992 was an inactive season, but the first storm happened to be Hurricane Andrew—a very high impact event for both Florida and Southern Louisiana. Remember that it only takes one storm hitting your area to cause a disaster, regardless of the overall activity predicted in the seasonal outlook.

With an active season on the horizon, those of us living along the Gulf Coast should begin preparations now. Take the time to develop or review your family's disaster and evacuation plans so that you will be ready if a disaster should occur.

Hurricane season officially runs from June 1st through November 30.



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Rising River: The Great Flood of 2011

1927, 1937, 1973, and 1979— what do they have in common?

Anyone familiar with the long history of flooding along the Mississippi River knows that these four years saw some of the worst flooding along the lower half of the river, and we can now add 2011 to that list as well.

From April 21st through the 27th, heavy rains fell across large portions of the middle Mississippi and Ohio River valleys. The showers and thunderstorms were focused along a frontal boundary that had stalled across the middle of

the country. Over the course of that week, several locations recorded 12 to 15 inches of rain—most of which would eventually drain into the Mississippi or Ohio Rivers.

A cold front finally swept through the area late on April 27th giving the area a reprieve from the torrential downpours. The respite would not last long, however. By April 30, another cold front moved into the middle Mississippi River valley and stalled—resulting in another round of heavy rains that lasted through May 2.

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Summer Climatology and Outlook

The summer months of June, July and August are characterized by hot and humid conditions across southeast Louisiana and Southern Mississippi. Cold fronts rarely make it this far south during the summer months, so relief from the heat is generally limited to isolated to scattered showers and thunderstorms that typically occur during the afternoon hours on many summer days. On average, the summer months are some of the wettest of the year, and it's not uncommon for some of the thunderstorms to produce locally heavy downpours of rain.

The lack of cold fronts moving into or through the area, combined with the high sun angle, also results in a more uniform temperature distribution across the region during the summer months when compared to the other seasons. Daily minimum temperatures generally range from the upper 60s to the middle 70s and normal high

June			
	High	Low	Precip
Norm	86-91	68-73	5.0-6.25
Record	100-103	46-55	

temperatures typically range from the upper 80s into the lower 90s.

The daily temperature range tends to be slightly lower in coastal areas due to the moderating effects of the Gulf of Mexico and the development of a daily sea breeze through much of the season.

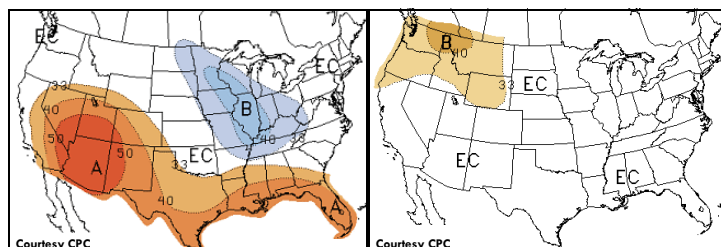
July			
	High	Low	Precip
Norm	88-92	70-75	5.5-7.0
Record	101-103	56-60	

August			
	High	Low	Precip
Norm	88-92	69-74	5.0-6.25
Record	102-106	56-60	

Monthly record lows are generally in the 50s while monthly record highs are almost all in the 100 to 105 degree range. Rainfall can be highly variable from one location to another during the summer months due to the somewhat random nature of summertime convection. However in general, the normal monthly rainfall amounts are in the 5 to 6 inch range.

This summer is off to what we might consider a blazing start. A strong ridge of high pressure has been resulting in significantly higher than normal temperatures with several records falling during the first 5 days of June. Afternoon temperatures have been rising into the upper 90s and even into the low 100s—something that usually does not happen until much later in the season.

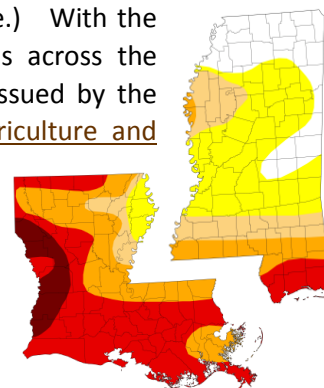
The Climate Prediction Center issued its summer outlook on May 19. They expect warmer than normal temperatures to persist through the summer season this year. The outlook indicates an equal chance of above normal or below normal precipitation for the region during the summer months.



Left: Temperature Probabilities for June, July, and August
Right: Precipitation probabilities for June, July, and August

Another artifact of the strong upper level ridge is that we have seen significantly less precipitation than usual. In fact nearly the whole area is experiencing a severe or extreme drought as indicated by the [US drought monitor](#) graphics below. (The only exceptions are those areas that are immediately adjacent to the Mississippi and Atchafalaya Rivers where flood waters have resulted in a higher water table.) With the significant drought conditions across the area, burn bans have been issued by the [Louisiana Department of Agriculture and Forestry](#) for the entire state of Louisiana. Additionally, the [Mississippi Forestry Commission](#) has issued burn bans for all of the Mississippi coastal counties as well as Pike County in

Southwest Mississippi.



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Bush Tornado is First F/EF-3 in Southeast Louisiana Since 1992

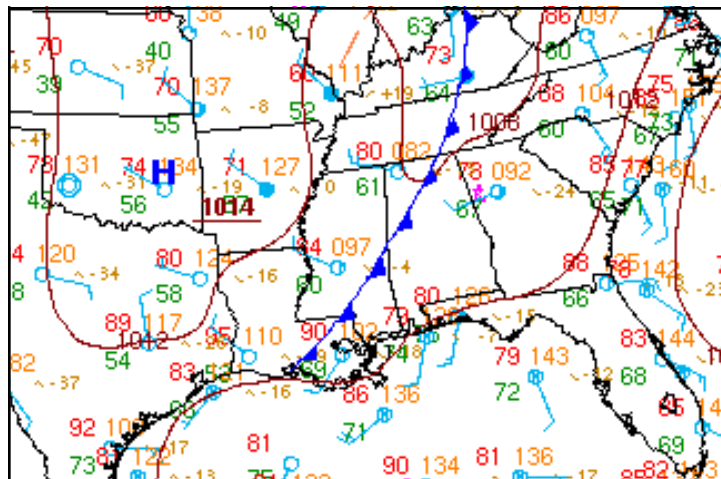
Synoptic Background and Radar Representation

On May 26, a cold front dragged slowly southeastward into Southeast Louisiana and Southern Mississippi. Ahead of the cold front, scattered showers and thunderstorms developed across the region, prompting several severe thunderstorm warnings and a few tornado warnings as well.

Throughout the event, the public reported several instances of large hail—some as large as golf balls in the Lacombe area. Additionally, two tornadoes were confirmed by NWS survey teams. The first tornado was an EF-0 that touched down near Ocean Springs, MS in Jackson County. The second tornado touched down near Bush, Louisiana in St. Tammany Parish and was rated an EF-3 on the [Enhanced Fujita Scale](#). This is the strongest tornado to occur in the WFO LIX forecast area since an F3 tornado moved through La Place and Reserve in St. John the Baptist Parish on August 25, 1992 as Hurricane Andrew approached the area.

The storm that spawned the EF-3 tornado near Bush, LA originally formed near Folsom, LA around 4pm. As it moved eastward, it began showing signs of rotation. By 4:24pm, the radar was indicating a strong mesocyclone had formed within the storm, and NWS forecasters issued a tornado warning by 4:27pm. The tornado developed shortly thereafter touching down near the intersection of HWY 40 and Birtue Rd (about 8.5 miles west of Bush, LA). The tornado moved along an East-Northeast path for roughly 6 miles reaching a maximum intensity of EF-3 with winds estimated near 140 mph. At its peak, the tornado was roughly 150 yards wide. The tornado finally lifted about 3.7 miles NW of Bush as it approached the Bogue Chitto River.

The images below are radar representations of the storm at its strongest. On the left is the radar base reflectivity and on the



Surface Analysis at 21z (4pm CDT) May 26

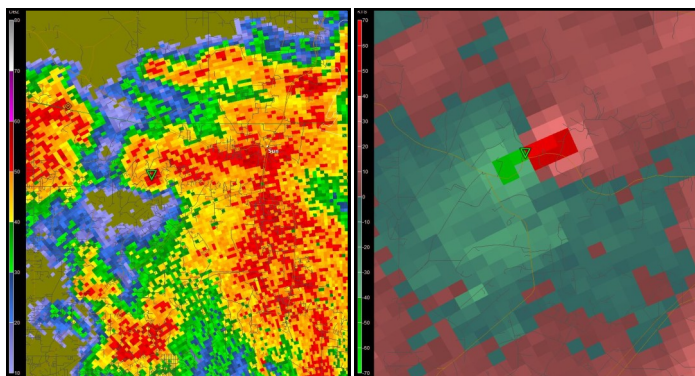
right is the radar base velocity. In both images, the radar is indicating a tornado vortex signature (as noted by the green triangle symbol). In the velocity signature, green pixels indicate movement toward the radar, and red pixels indicate movement away from the radar—with the radar located to the southeast. The bright green pixels adjacent and to the left of the bright red pixels indicate strong cyclonic (counter-clockwise) rotation.

Two different videos of the tornado have surfaced on YouTube and can be accessed [here](#) and [here](#).

NWS Survey Summary and Damage Photos

Touchdown occurred near the intersection of HWY 40 and Birtue Rd. One home on Birtue Rd. suffered significant loss of roof covering and partial loss of second floor structure, supporting strong EF1 intensity shortly after touchdown. On Sherwood Forrest Rd. one travel trailer suffered significant damage, but was not flipped and remained largely in tact. From this area, the tornado continued on an ENE track and crossed Bob Baxter Rd. near HWY 40. The tornado continued to cause significant damage, snapping several large pine trees and downing power lines along HWY 40. Another home on HWY 40 about 1/4 mile east of HWY 1083 lost approximately 40 to 50% of its roof covering. Damage in these areas supports EF1 intensity.

The worst damage was observed near the intersection of HWY40 and Jenkins Cemetery Rd where one frame home lost its entire roof covering and roof framing structure. Two exterior walls on this home were partially collapsed inward and a third wall was missing. A second frame home lost roughly 90% of its roof covering and roof framing structure with one wall partially collapsed inward. The tornado also snapped two wooden power poles in this area. This damage was the basis for the EF-3 rating with



Radar reflectivity (left) and velocity (right) signatures of the storm that spawned the EF-3 tornado near Bush, LA.

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Bush Tornado, cont.

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Pictures From Left: (A) a severely damaged home near the intersection of HWY 40 and Jenkins Cemetery Rd; (B) Aerial imagery of the worst damage; and (C) another severely damaged home on Jenkins Cemetery Rd.

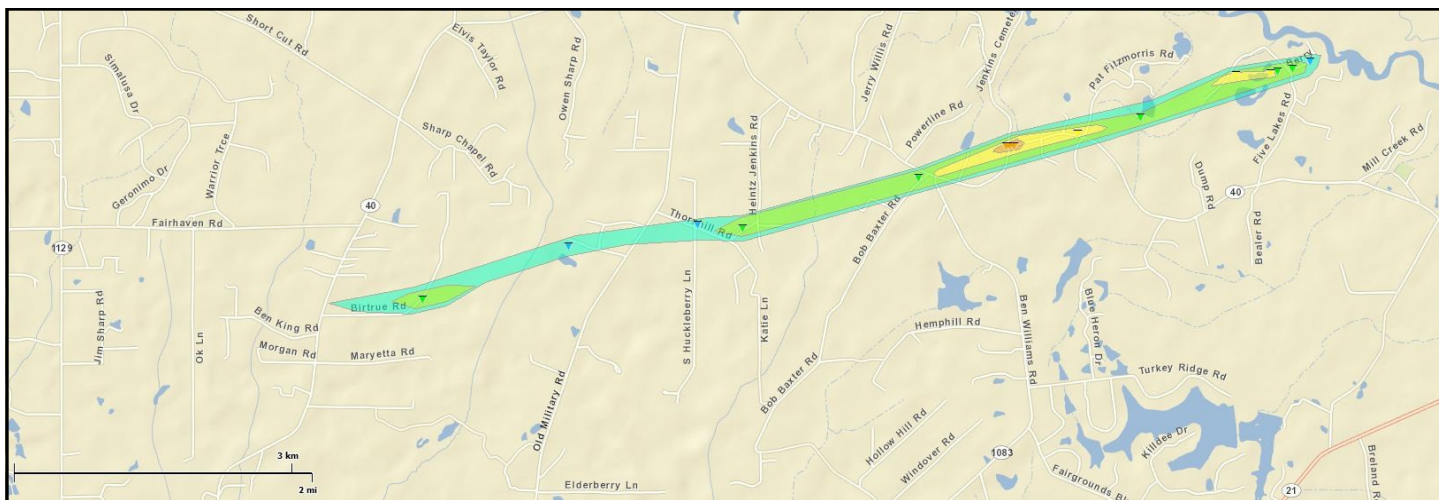
estimated winds of 140 mph. Significant damage was also done to several other homes in this area with all or partial loss of roofing material and roofing structure.

From here, the tornado traveled ENE along HWY 40, causing continued significant damage to mostly pine trees. Nearly every tree in the tornado's path was either snapped or lost most of its branches, supporting a minimal EF-2 rating through this area. The tornado then moved toward the 5 Lakes campground, where it turned a double wide trailer on its side before weakening slightly as it moved further into the campground—where it flipped or significantly damaged another 10 to 15 mobile homes that did not appear to be tied down (pictures above). This damage is supportive of a strong EF-1 rating through much of the campground. According to the St. Tammany Parish Sheriff's Office, several residents of the

campground were trapped and had to be rescued from their damaged/destroyed mobile homes. Only 5 minor injuries were reported, mostly due to flying glass and other debris.

At the intersection of 5 Lakes Rd. and Berry St., a framed brick home lost about 40 to 50% of its shingles with most windows also broken—possibly due to flying debris. An attached utility room was also collapsed, but his appeared to be an addition that may not have been as strong as the home itself. The tornado dissipated shortly after passing this house, with only a few large pine branches snapped along Berry St. and no apparent damage to the tree line beyond the end of the road.

For additional damage pictures, including several aerial pictures courtesy of nola.com and pictures from near the Five Lakes Campground, please refer to the WFO LIX website, [here](#).



The surveyed track and intensity ratings are indicated on the map above. The damage ratings along the track are color coded as indicated in the legend. While the track polygon widths are approximate, individual triangle icons indicate observed damage that was GPS-tagged by the NWS survey team.

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Rising River: The Great Flood of 2011, cont.

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Throughout the second round of heavy rainfall, portions of Arkansas, Tennessee, and Kentucky were doused with an additional 10 inches of rain. Once again, the rainfall would eventually drain into the Mississippi or Ohio Rivers, which were already swollen from the normal spring crests as well as the heavy rains that had fallen just one week prior.

As rain continued to pour and the rivers continued to rise, it became evident that historic river flooding was inevitable. The water level in the Ohio River was rising rapidly at several forecast points—by over a foot per day in some places. Near the confluence of the Ohio and Mississippi Rivers at Cairo, IL, the Ohio River reached 61 ft on May 3rd—just a few hours after the Army Corps of Engineers (USACE) decided to move forward with an intentional breach of the levee at Birds Point in Missouri in order to keep flood waters from overtopping the levees in Cairo, IL. Later on the 3rd, the river finally started falling at the gage in Cairo.

Downstream the problems were just beginning. With such a large volume of water entering an already swollen Mississippi River, hydrologists at the Lower Mississippi River Forecast Center (located in Slidell, LA) were forecasting record-level crests at several downstream forecast points. The table above includes the crest levels and record data for several forecast points along the Ohio, Mississippi and Atchafalaya Rivers.

By May 9, the Mississippi River had risen above the official flood stage at New Orleans—which prompted the USACE to open the Bonnet Carré Spillway—which diverts water from the Mississippi River into Lake Pontchartrain near Norco, LA. This marks the 10th time the Bonnet

Carré Spillway has been utilized. At the peak operation, about 310,000 cfs of water flowed through a total of 330 gates on the spillway structure. (The spillway structure contains a total of 350 gates.)

Even after the Bonnet Carré Spillway was opened, the river continued to rise upstream as the crest slowly moved southward. By May 14th, the flow past Baton Rouge was nearing 1.5 million cfs, and continuing to rise. In order to relieve pressure on the levee system through the city and down river of Baton Rouge, the USACE opened the Morganza Spillway structure which diverts water from the Mississippi River into the Atchafalaya River. The Morganza Spillway had only been utilized one other time in its history—in 1973 to relieve pressure on the Old River Control Structure.

While the opening of the Morganza Spillway structure eased flooding conditions along the Mississippi River, it resulted in increased flooding concerns along the Atchafalaya River. At the peak opening, there were 17 gates open on the Morganza Spillway with roughly 114,000 cfs of water flowing through the structure.

Initial modeling by the USACE indicated that some communities along the Atchafalaya River would flood with up to 20 feet of water. Luckily, as the crest moved down river, it proved to be a bit lower than originally forecast, resulting in significantly lower impacts than the initial projections had indicated.

Now that the Mississippi and Atchafalaya Rivers have crested and flows have begun to subside, the USACE has begun the slow process of closing gates on the Morganza Spillway. As of June 5, only 7 gates remain open on the Morganza Spillway. 330 bays remain open on the Bonnet Carré Spillway to control flows past New Orleans.

Location	2011 Crest*	Record
Cairo (O)	61.72	59.5 (1937)
Vicksburg (M)	57.17	56.2 (1927)
Natchez (M)	61.93	58.04 (1937)
Red River Landing (M)	63.39	61.61 (1997)
Baton Rouge (M)	45.01	47.28 (1927)
Donaldsonville (M)	32.53	36.01 (1927)
Reserve (M)	23.97	26.00 (1929)
New Orleans (M)	17.38	21.27 (1922)
Morgan City (A)	10.35	10.53 (1973)

*2011 Crest information is preliminary from raw data and is subject to revision after quality control.

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National Weather Service New Orleans/Baton Rouge...
Where Science Impacts Decisions and Decisions Save Lives



LIX in the Community

Over the past few months, several groups have stopped by our office for visits. Most of the groups have been girl scout or boy scout groups. During the office visit, the groups participate in an office tour where they learn more about what the weather service does on a daily basis and how we create and disseminate our forecasts. The tour usually concludes with the evening balloon launch, and if the weather is calm enough, sometimes the scouts even get to help out! The pictures at right are from two different office visits that took place this spring.

In addition to office tours, WFO LIX staff members have participated in several other outreach activities. We've recently helped with several hurricane season kick off meetings throughout the forecast area, and also helped staff tables at the Jefferson Parish Hurricane Prep Rally.

In the coming months, we will be participating in a few storm spotter talks and hurricane preparedness meetings. We'll post updated information to our [Facebook page](#) whenever there are upcoming outreach events, so be sure to "like" us to get the most up to date information!



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A Note From the Editor...

The 2011 Atlantic hurricane season is forecast to be an active one. The seasonal outlook does not indicate where or when a tropical cyclone will make landfall. Stay up to date on the tropics using the [NHC website](#) and the [WFO LIX website](#). Additionally, when creating/reviewing your family's disaster and evacuation plans, be sure to gather all of the phone numbers and important documents you may need in the aftermath of a disaster. Some of the phone numbers can be found on the NOAA Extreme Weather Information Sheets for [Southeast Louisiana](#) and [Coastal Mississippi](#). As always, we hope that we will not be impacted by a tropical cyclone, but it's important to have plans in place now just in case.

Danielle Manning
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